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Anette Vandsø

Listening to the world

Sound, media and intermediality in contemporary sound art

Anette Vandsø
Assistant Professor, PhD
Institute for Aesthetics and Communication,
Aarhus University, Denmark
aekava@hum.au.dk

www.soundeffects.dk



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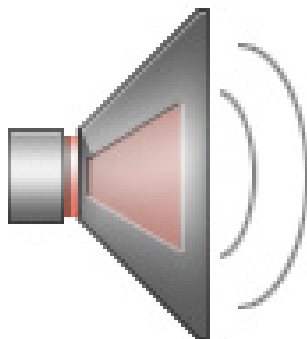
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Abstract

*This article explores the problematics of explaining what conditions our listening experience of contemporary sound artwork. Based on an analysis of the media artist Anne Niemetz and nano-scientist Andrew Pelling's *The Dark Side of the Cell* (2004), the article asserts that we should consider not just the 'the sound', 'the world' or 'the listening experience', but 'the invitation' itself, that is, the sound act that can be seen as a parallel to the linguistic speech act that actively constitutes its content rather than representing it in a more direct way. This sound act is furthermore described as a complex intermedial act based on a mixture of sound and text as well as the use of technical media and the double framing as art and science.*

*"Just as today we listen to the song of the forest and the sea so tomorrow
shall we be seduced by the vibrations of a diamond or a flower"*
– F.T. Marinetti and Pino Masnata, *La Radia*, 1933

Numerous contemporary sound artworks use scientific modes of data collection, often as a result of collaboration between artists and scientists. However, as recipients we are not invited to analyse data scientifically but rather to listen – to listen to the world, to the Earth's seismic movements,¹ brainwaves,² living cells. The latter is the case in the media artist Anne Niemetz and nano-scientist Andrew Pelling's audio visual event *The Dark Side of the Cell* (2004), which invites us to listen to the "undiluted result of the cells, unmodified by sound effects" (Niemetz & Pelling, "The Singing Cells", 2004).³ Such art works possess an almost 'eerie' realism as they immerse their listener into an alien and constantly vibrating environment by means of advanced technology.



*Example 1: Excerpt from part I, clear-pitched sounds from observing the motion of unperturbed *Saccharomyces cerevisiae*, Anne Niemetz & Andrew Pelling's *The Dark Side of the Cell* (2004)*

What conditions our listening experience if we are to evaluate the functioning of the artwork as it engages its recipient rather than the methods of production?

Several scholars point to the fact that such art works might *appear* to be a direct presentation of ‘reality’, but they actually function through their intertextual references and conceptual levels (Kim-Cohen, 2009, Miletus, 2008). The sound artwork therefore establishes its effects due to already existing culturally produced symbolic forms rather than due to the singular relation between sound and world. This article wishes to elaborate on that statement through an analysis of *The Dark Side of the Cell*. The article argues that it is obvious that the intertextual references are of importance to this artwork, but that it is not productive solely to conceptualise the sound artwork as a ‘text’, because its use of specific artistic and technical media is essential to its effects. *The Dark Side of the Cell* is for instance often classified as ‘media art’ and presented at media art festivals such as The Microwave International New Media Arts Festival in The Hong Kong City Hall, 2008.

I. The Dark Side of the Cell

In the same way as pictures of the dark side of the moon brought to us continuously since 1959, when the Soviet satellite *Lunar 3* shot those grainy pictures of the moon’s surface, *The Dark Side of the Cell* invites us to move beyond our natural perception and experience the sounds of living cells produced using the advanced nano-technology of the Atomic Force Microscope (AFM).

The AFM was originally used to produce visual images of objects on a nano-scale. Working as a ‘tacto-scope’, it touches the surface of the sample, very similar to the way the needle of a gramophone reads the vinyl, and by this means the AFM can produce data that can be transformed into a visual image. In the new research field of ‘sono-cytology’, a term coined by Pelling and Professor James Gimzewski of the UCLA Department of Chemistry, the needle of the AFM is held steadily in one position, revealing that the wall of a living cell oscillates on a nano-scale. Since the frequency of these oscillations is within the audible range of the human ear, they only need to be amplified in order for us to be able to hear them (Niemetz, 2004).

It is allegedly such ‘cellular audio’ – retrieved through a number of laboratory sessions made from 2002 to 2004 – that we are presented to in the five separate movements that form the compositional body of *The Dark Side of the Cell*. The material was first presented at the Los Angeles County Museum of Art in 2004 in an installation concert. Twenty speakers were placed in a darkened space while still images and videos of the cell samples and their sonograms were projected on white sculptural objects, all in all creating an immersive acoustic experience. The material has since been presented several times in installations where the audio and visual design has been slightly altered, although the same general principles have

been maintained.⁴ The project is now thoroughly documented at the website <http://www.darksideofcell.info> (Niemetz & Pelling, 2004).

There are several other artworks that invite us to listen to sounds derived from a cellular level such as the biologist Mary Anne Clark and artist John Dunn's musical sonifications of data from protein presented on the CD *Life Music* (1998)⁵ or the



Example 2: Picture of the visual design, *The Dark Side of the Cell*, 2004, Photo: Andrew Pelling

biologist Katie Egan and artist Joe Davis' installation *Audio Microscope* (2000), which similar to *The Dark Side of the Cell* presents a direct audification of vibrations, but using optical detectors.⁶ *The Dark Side of the Cell* is, however, particularly interesting as a sound artwork because it actually inserts the needle of the nano-scaled microscope directly into the matter, thereby 'reading' the continuous vibrations of the cell similar to the way a gramophone needle reads the bumps in the groove on a record – that is, if this was a record that was constantly being written. This aspect concerning the production methods adds to the sense of realism: Sound is by definition vibrations that human beings can hear (c.f. Sterne, 2003), and in that sense vibrations on a nanoscale are not sound. What we hear is therefore – as mentioned – an *audification* of vibrations. But due to the knowledge concerning the means of production, *The Dark Side of the Cell* rather presents itself as a technological means of eavesdropping on a cellular level – a revelation of sounds that are always already there.

II. The relation between the sound and its source

What conditions our listening experience in relation to sound art? The current research on sound art stands divided on the matter. Some claim that sound as a medium has a particular immediate quality, and that this is the main conditioning factor in sound art (Labelle, 2007, Voegelin, 2010). Others claim that such an analysis overlooks the intertextual and conceptual aspects that to a high degree shape our listening act (Kim-Cohen, 2009, Connor, 2011).

The notion that sound is a particular immediate or direct medium is not new. On the contrary, if we lend an ear to the many voices of the disparate field of sound studies, a recurrent theme is the question of how listening to the world conditions our experience of it in a fundamentally different way than seeing. It is claimed that we look *out* through our eyes, but sound enters our ears, and therefore seeing creates a distance to the perceived, while sound immerses us in it. Consequently, seeing inclines us to perform logical, objective, judgements, while hearing invites a more phenomenological, subjective approach (see for instance, Voegelin, 2010). It is furthermore claimed that modernity has suppressed oral culture and consequently elevated the eye over the ear as the preferred sensory organ (e.g. Berendt, 1988). It is also stated that the visual paradigm, with its linear, casual mode of thinking, is challenged by modern audio-visual media that implies a more non-linear and multimodal space (e.g. McLuhan, 2005, p. 68-72). Due to the particularity of listening, some even call for an 'acoustemology', an acoustic epistemology (Feld, 2004, pp. 223-239). Jonathan Sterne (2003) claims that this discourse based on the difference between the senses is almost hegemonic in sound studies and with a critical term he calls it the 'audio-visual litany' (Sterne, 2003, p. 15).

Listening to the world is recognized as a particular mode of experience on a theoretical level, but it is also established as a practice. This can be seen in sociology – beginning with R. Murray Schafer’s extensive *World Soundscape Studies* in the late 1960s, which, as the title indicates, focuses not on the landscape, but on the soundscape of places (Schafer, 1994). And with the magnetic tape a new kind of compositions based on recordings of sounds from our everyday surroundings, rather than on instrumental performance, emerges in the early 1950s. The American composer John Cage offered his view of the difference between traditional music and this new music based on recorded sounds:

Musical habits include scales, modes, theories of counterpoint and harmony, and the study of the timbres, single and in combination of a limited number of sound-producing mechanisms. In mathematical terms these all concern discrete steps. They resemble walking – in the case of pitches, on steppingstones twelve in number. This cautious stepping is not characteristic of the possibilities of magnetic tape, which is revealing to us that musical action or existence can occur at any point or along any line or curve or what have you in total sound-space; that we are, in fact, technically equipped to transform our contemporary awareness of nature’s manner of operation into art [...] New music: new listening. Not an attempt to understand something that is being said, for if something were being said, the sounds would be given the shapes of words. Just an attention to the activity of sounds.
(Cage, 2004, pp. 9-10).

Cage foresaw that the future of music would be extended listening to the world through technology. This will allow us to listen to the sounds of the world that we normally cannot hear and thereby let us experience the world, not as objects but as processes, vibrations: “within each object, of course, a lively molecular process is in operation. But if we are to hear it, we must isolate the object in a special chamber” Cage (1981, p. 179) states in 1979. A statement that anticipates artworks such as *The Dark Side of the Cell*.⁷

It is not surprising that these ideas of how listening to the world is a more direct way of experiencing it, are used as *the* model for explaining the effects of sound art. First of all this discourse is, as mentioned, predominant in sound studies (c.f. Sterne, 2003, Kim-Cohen, 2009). Secondly, such notions are indeed confirmed by the sound artworks themselves. They do seem to be ‘just sounds’ as Cage claims, and not something being said. In his book on sound art Alan Licht for instance reproduces this distinction between the expressive act and ‘just sounds’ by claiming that sound art as a genre is less focused on the subjective expression of the artist and more concerned with “sound as a phenomenon of nature and/or technology” (Licht, 2007, p.14). And if we turn to Salomé Voegelin’s book on sound art from 2010, the introduction is based on the difference between the senses:

Seeing always happens in a meta-position, away from the seen, however close. And this distance enables a detachment and objectivity that presents itself as truth.

Seeing is believing. The visual 'gap' nourishes the idea of structural certainty and the notion that we can truly understand things, give them names (...) By contrast hearing is full of doubt: phenomenological doubt of the listener about the heard and himself hearing it. Hearing does not offer a metaposition; there is no place where I am not simultaneous with the heard. However far its source, the sound sits in my ear. Voegelin, 2010, p. xii

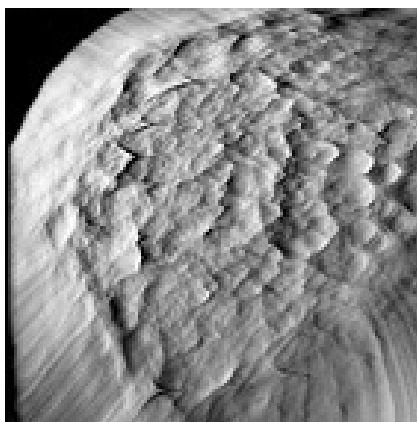
Consequently, she concludes that a philosophy of sound art must have at its core the principle of sharing time and space with the object or event under consideration (Voegelin, 2010, p. xii). Brandon Labelle (2007) also emphasizes that the specific qualities of sound as an artistic medium are essential to sound art. Sound "leaves a body and enters others" (Labelle, 2007, p. ix). It is a relational, site-specific phenomenon that performs space (Labelle, 2007, p. ixff).

These descriptions actually reflect my experience of *The Dark Side of the Cell*. I do experience being confronted with a lack of certainty, as Voegelin puts it. I do experience being *immersed* in this strange environment where I am not experiencing the cell as a thing or a frozen image but rather the living cell as an event as it unfolds in time and space. *The Dark Side of the Cell* does seem to be a 'site-specific' artwork – although it is a very small site (the cell). The sound seems to leave one body – the cell's – and enter my ears, and thus to be 'relational' rather than representative as Labelle describes it.

There is but one problem if I am to use this as an analysis of *The Dark Side of the Cell*: I actually cannot hear that these sounds come from cells. It is *only* due to the title and other paratexts (Genette, 1997) – such as the text and images on the webpage, interviews and articles, all functioning on a parasonic level – that we can identify these sounds as cellular sounds. Consequently, it is clearly not just sound as a medium but also language that 'performs'. The source of the sounds is not presented to us through the relational quality of sound, as described by Labelle. Rather it is something being 'told', as my self and others have concluded with regard to similar artworks (Milutis, 2008, Aremark, 2010, Vandsø, forthcoming). In this sense, Cage's description of listening to pure sounds may aptly reflect our *experience* of an artwork such as *The Dark Side of the Cell*, but not how this experience is conditioned by the artwork. This distinction is important to make – at least so that we know whether we are trying to describe the fascinating effects of sound art or to analyse how these effects are established.

Furthermore, *The Dark Side of the Cell* has several very blatant intertextual references to moon travel, as seen both in the title and by the pictures on the webpage. This makes it obvious that our listening experience is not just conditioned by the specific qualities of sound as an artistic medium and listening as a sense, but by the textual, intertextual and conceptual aspects.

Through the intertextual references the sounds are placed in a larger narrative. These references *invite us* to imagine, that we are listening to an unfamiliar territory beyond



Example 3: *The Dark Side of the Cell*.
Picture of a cell surface from the webpage
www.thedarksideofcell.info,
photo: Andrew Pelling

our logical comprehension. The ‘site’ (the cell) is then imaginary, not an actual site. It is told, enunciated – hence the citation marks.⁸ Accordingly, the site specificity is an *effect* of the overall communicative act. The relational quality of the sound that Labelle describes is also an effect. We cannot hear any indexical relation between sound and source, but we *imagine* that this is not a symbolic sound image composed by a composer sitting at his or her computer, but rather a direct imprint of the vibrating cells.

In that sense an analysis of *The Dark Side of the Cell* supports Kim-Cohen’s (2009) claim that the textual, intertextual and conceptual aspects are more important to sound art than the specific qualities of sound. But in order to describe what conditions our listening experience, it seems important to include not just the intertextual references, but also the intermedial combination of sound and the paratexts that contain information regarding the source of the sounds, and the technological means of production, since this knowledge shapes our listening experience.

III. Text-sound relation

It is characteristic to *The Dark Side of the Cell* that it consists of sounds, which lack information that we can understand. These sounds are combined with paratexts with much information. The title for instance tells us that these are sounds from a cell. Linguistic signs have the ability to designate a referent or an idea. The word ‘cell’ in the title therefore refers to the general idea of a cell. The sounds in *The Dark Side of the Cell* however, are based on an indexical imprint of the cell-wall vibrations. Therefore they do not designate *a* cell, but *this* cell. And because the sounds unfold in a temporal sequence, they designate the cell in a specific, singular event. We

cannot hear this indexicality, if we listen to the sounds alone, but due to the title we perceive them as sounds with such an indexical quality.

Even though the sounds are clearly presented as sounds of cells, it is still impossible for us to hear that they are sounds of cells. The text and sounds therefore do not appear to be redundantly pointing towards the same referent – the way a picture of a pipe with the title ‘a pipe’ does.⁹ Rather, the artwork uses a combination of a defining and specific title and a very open and indeterminate sound. This disparity between text and sound appeals to our ideation, similar to the way the German literary theorist Wolfgang Iser (1975) claimed that a textual *Leerstelle* or ‘empty place’ activates the recipient, not by telling us something, but by leaving something untold, by leaving a gap in the narration for the recipient to fill out. *The Dark Side of the Cell* excels in activating its listener’s imagination through the paratexts directing our interpretive act in a very decisive way while leaving the sounds themselves impossible to understand. It is because we are presented with this specific yet unintelligible sound that we feel that we are listening to the constant writing of a non-human, otherworldly code beyond our understanding. Had our attempts to understand or decode the sounds succeeded, the artwork would not have this strange ‘eeriness’. Furthermore, the fluctuation of sound and its lack of solid materiality leave plenty of room for us to imagine or construct an idea of this small-scaled ‘site’ and the material from which the sounds originate.

Finally, the titles specific intertextual reference to the phrase ‘the Dark Side of the Moon’ indicates that this artwork invites us on a journey that will take us to the unknown, that which is beyond our natural perception.

The main point of this short analysis, which only explores part of *The Dark Side of the Cell*, is that the question of the involved artistic media is not rendered obsolete by the vast amount of intertextual and conceptual aspects. On the contrary, the effect of *The Dark Side of the Cell* cannot be understood without regard to the intermedial use of sound and text.

In the German discourse on sound art, *Klangkunst* is defined as sound installations and therefore it is considered an intermedial art form per se: “Klangkunst ist zum hören und zum sehen bestimmt”, as Helga de la Motte-Haber (1999, p. 13) puts it. This is also the case in *The Dark Side of the Cell*. But in order to understand the intermedial condition in *The Dark Side of the Cell* – for instance, the relation between the text and the sound – we have to include more than the sensory modes of hearing and seeing. According to literary theorist Lars Elleström (2010), four modalities constitute a medium: the sensory, semiotic, spatiotemporal and material modes. What is significant in the intermediality of *The Dark Side of the Cell* is not just the sensory mode, difference between hearing and seeing, but rather the different distinct semiotic modes of text and sound (symbolic versus indexical signs), the temporality of sound, and also the lack of solid materiality in the sound.

The fact that there is a significant intermedial relation between the title and the sound makes not just this artwork but all sound artwork intermedial, in line with W.J.T Mitchell's claim that "all media are mixed media" (Mitchell, 2005, p. 256). This also goes for those sound artworks that are not presented in an installation but just in a sound file.

IV. Sound and the technical medium

One could delve further into the entire installation, the scenography or the webpage text and images, but instead I wish to add more dimensions to the question of intermediality.

If we are to understand how our listening experience is conditioned, we must examine not only the combination of sound and text (or sound/image or sound/installation which I have neglected in my analysis) but also the material apparatus producing the sound. This aspect would normally be seen as exterior to the artwork – Mitchell, for instance, does not believe that the concept of mixed media should include technical media (as described by Hayles, 2002, p. 43). However, the distinction between the representation of cells and the technologies producing the imagery cannot be drawn in the case of *The Dark Side of the Cell* (c.f. Hayles' arguments in relation to digital literature; 2002, p. 19). This is also the case even if the technologies involved in the production are not present but 'told' as they are in *The Dark Side of the Cell* – as opposed to, for instance, *Audio Microscope*, where we can actually see the entire laboratory setup producing the sounds of cells.

That the use of the technical media conditions our listening experience is of course an undeniable fact if we consider the process of production: without the Atomic Force Microscope and the sound-producing techniques using transducers, which turn the vibrations into sounds, there simply would be no sounds. In the act of reception, however, we cannot hear these techniques. The knowledge of the means of production is not just a 'context' for an original artwork. The original 'meaning' of the sounds is not merely modified by the knowledge we get from the paratexts; rather, our entire reception of the sounds is shaped by the knowledge of their production.

First of all, an essential part of our reception of the sounds is the knowledge that they are not formed or crafted by a composer. According to the media theorist Friedrich Kittler (1999), the new media technologies – such as the gramophone – radically changed our possibilities of communicating data. Whereas conventional music uses a symbolic discourse that due to the notational system can only notate what can be translated into the symbolic form of conventional notation, the sound recorder can stream data that is unshaped by symbolic grammatologies. Recording can therefore capture what Kittler, with the French psychoanalyst Jacques Lacan,

calls the 'real', that is, reality beyond or before the linguistic meanings and the symbolic realm (Kittler, 1999, pp. 15-16). This resembles similar ideas of the photograph as a 'message without a code', as described by Roland Barthes (1977, p. 17).

Kittler (1999, pp. 38-42) quotes the German author Rainer Maria Rilke's fascination with the gramophone expressed in an essay from 1919. Rilke imagines that the gramophone needle can be inserted directly into the matter – for instance, into the coronal suture of the human skull – thereby allowing us to listen to the inscriptions made not by humans but by nature in itself.¹⁰ The sound-reproduction technologies are developed with such ideas of immediacy: that we can listen to an authorless noise. And it is these mythologies that *The Dark Side of the Cell* taps into when it claims that the sounds are produced by inserting the needle directly into the matter.

It is as though the range of our ears is extended when it is connected to the technological ear, and in this way this artwork communicates much more than its subject matter – the sounds of cells; it tells us something about this asymmetry between our natural perception and the perception of the nano-scaled technological 'recorder'. By listening through nanotechnology, we experience the paradox of being allowed to perceive a space, which we can never enter.

These effects of immediacy are of course effects. The sounds may be remediated without being re-written by a symbolic discourse, but they are nevertheless largely interwoven into mythologies concerning technology and nature. Kim-Cohen (2009, p. 100) notices, the sounds produced if Rilke could listen to the coronal suture may be authorless, but not readerless or contextless, and the same goes for *The Dark Side of the Cell*. Besides, the sounds are not authorless either: they are selected, presented, put forward by Niemetz and Pelling, and in this sense the entire artwork always has this aspect of being a communicative act with a sender and a recipient even though it does not present itself as such.

Moreover, while the sound-reproducing technologies seem to capture the cell as a living cell event and invite us to share the time and space of the lived cell – one of the main principles of sound art according to Voegelin, as quoted above – it is, however, important to remember that we are in fact *not* sharing time and space with the cell. The time is a bracketed, 'held' time, forever in a frozen 'now' that has already become a 'then', the moment it was recorded. We may experience the sound as a token of the pure singularity of the event, but in fact the recording detaches the sound from the event because recorded sound can be re-played and re-mixed.¹¹ In opposition to the notions of the directness of recorded sounds, several have claimed that recording the sound causes it to enter the realm of writing; the symbolic, social realm (Kahn, 2001, p. 8). With recording techniques we are not just talking about the world, we are also recording it, articulating it through sonic representations. *The Dark Side of the Cell* is a good example of how recordings are used as a way to 'talk about' contemporary issues such as the new possibilities that nano-technology presents.

V. Sound and science

The mixture of art and science in *The Dark Side of the Cell* is different from the relocating strategies known in the art field, for instance in Marcel Duchamp's ready-mades, which present a non-art object like a snow shovel as art and thereby cause them to become art. Unlike the readymade the material in *The Dark Side of the Cell* is not relocated *into* the art field: it is art but also still science and is consequently an interdisciplinary phenomenon. What happens is rather that the aesthetic, sensuous relation has been brought into the laboratory. By this means our listening activity is shaped both by the knowledge that what we are listening to is 'science' and by the imperative that we should engage in an aesthetic, sensuous relation to what is heard rather than analyse it scientifically.

This shift in the Kantian categories emphasises that our listening experience is conditioned by the overall institutional categorisation as art and/or science. Due to the institutional categorisation the material appears to us to be a rational, objective audification of data instead of an artistic interpretation of nature. This enhances the realism and gives the artwork an effect of immediacy. We are, however, not invited to interpret data and draw general conclusions from the particular empirical studies, but to listen to the particularities and experience them in a phenomenological way. We are not invited to focus on what we can conclude or understand from the experiments with living cells, but rather we are confronted with sounds that we cannot decode or understand. In this way, *The Dark Side of the Cell* touches upon the dichotomy of science: that it, on the one hand, functions as a rational, objective way of uncovering facts about the world and on the other it always deals with what we do not understand, what is a mystery. Niemetz and Pelling touch on this subject in one of their presentations of the artwork, which they begin with this quote by Albert Einstein: "The fairest thing we can experience is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science" (Niemetz & Pelling, "singing cells", 2004).

VI. The intermedial sound act

In a critique of sound studies based on the physiology of hearing, Sterne (2003, p. 19) stresses that listening is more than just the physiological sense of hearing. Listening is a learned cultural activity, and should be studied as such. In relation to *The Dark Side of the Cell*, it seems as though the artwork uses culturally established modes of listening connected to specific media's ways of being media, rather than just the physiological characteristics of hearing or the physical qualities of sound.¹² This artwork uses our ideas of how certain media connect or mediate between the recipient and the source, or how the relation works between its code and its refer-

ent. Rather than composing with the colour and form of sounds, this artwork establishes an overall narrative of the remediation of the vibrations, thereby shaping our listening activity

In the analysis above I have discussed very different aspects of the artwork: The way it uses text and sound, microscope, science and art. Elleström points to the fact that the word 'medium' often refers to an incommensurable number of things we would call media, such as 'music', 'writing' and 'television' (Elleström, 2010, p.11). These are all examples of media because they function as an interspace, a 'middle' or a channel for mediating something. But these examples are also fundamentally different. To understand this difference, Elleström suggests differentiating between three different media aspects: 'basic media', such as text, organised sound, image; 'technological media', which are the actual physical media that can mediate basic media, such as the microscope; and 'qualified media', which are institutionalised media that are culturally qualified, such as music, sound art or science (Elleström, 2010, pp.12-13). Using Elleström's terminology, then my analysis has focussed on different *media aspects*: the intermedial combination of basic media (text/sound/image/installation), the use of technical media (the microscope as a means of recording sounds), and the large institutionalised mediating forms of art and science. It is essential to include all these different aspects in the analysis of *The Dark Side of the Cell*. We therefore have to establish a complex intermedial approach that combines insights from art and media studies.¹³ Such a broad approach is necessary in relation to all artworks using recorded sounds, since they always use a title and thus combine different basic media, and they always convey an idea of the technological ear that has heard the sounds, and they are always presented to us as 'something' – for instance, as sound art, music or science.

In the analysis of *The Dark Side of the Cell* I have shown how different media aspects are used as part of an overall communicative act that functions as a highly appealing invitation to the listener to activate his or her ideation to fulfil or understand what is presented. Through this aesthetic strategy, *The Dark Side of the Cell* actually succeeds in representing this unrepresentable 'dark side of the cell'.

Notes

1. Such as Chris Hayward's "Listening to the earth Sing" presented at the ICAD, 1992.
2. This can, for instance, be heard in David Page's "Dry Mud, 1997 (see, for instance, also Bailes, Barras & Whitelaw, 2006).
3. I wish to thank the Danish art historian Pernille Leth-Espensen for bringing my attention to this artwork and its particular use of technical media. For a fuller introduction to *The Dark Side of the Cell* and its relation to other artworks in the art-science field, the interested reader should consult her PhD on the topic (Leth-Espensen, forthcoming).
4. According to Anne Niemetz, the audio setup has used from 11-20 speakers depending on the location.
5. See the webpage: <http://algoart.com/music.htm> (Dunn 1996-2010).
6. As described in "Listening to living cells" (n.d., or Niemetz, 2004, p. 21).
7. For further reading on Cage and others' ideas of listening to the vibrations of the world, see Kahn, 2001, 195ff.
8. I have argued elsewhere that it is important to distinguish between sound in general and told or enunciated sound, using the linguistic theory of enunciation (Aremark, 2010, Vandsø, 2011, Vandsø, forthcoming).
9. Here I am paraphrasing Henri Magritte's painting "La trahison des images" (1928-29).
10. I was made aware of this passage by Rilke in the brilliant paper "Photophonics" by Stephen Connor (Connor, 2011).
11. Here I am paraphrasing the way Jacques Derrida (2002, pp. 13-19) revises Austin's description of the performative speech act. Derrida points to the fact that language does not receive its performativity due to the "pure singularity" of the event and the intention of the speaker – such as it has been claimed – but due to the citational, parasitic quality of speech. We always utter sentences that we know and that have been uttered before. This quality dissociates the performative speech act from the pure singularity of the event (c.f. Vandsø, 2011).
12. Brügger (2002) has an extended description of what characterises a media's way of being a media, its 'medianess' as do Elleström (2010). I am very inspired by these analyses but I have chosen not to include this theoretical discussion in the article.
13. Joergen Bruhn (2010, p. 228), who also is researching intermediality, discusses "heteromediality" as a term for the multimodal text. Such a term could be used in relation to *The Dark Side of the Cell*.

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